

Problematic Video Game Use among Teenagers in Sfax, Tunisia

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Abstract

Background: The aim of this study was to identify the prevalence and risk factors for Problematic video game use among Tunisian adolescents.

Methods: A cross-sectional study was carried out on 578 secondary school students, aged 14 to 20 years. They were recruited from seven secondary schools then randomly selected from the urban area of Sfax. The self-administered Fisher's 9-item questionnaire was used in this survey. To identify an associated problematic internet use, Young's 8-item questionnaire was used. The Hospital Anxiety and Depression scale (HAD) was administered to screen for anxiety and depression symptoms. An anonymous self-administered questionnaire covered socio-demographic, individual and family data.

Results: The prevalence of problematic video game use among urban Tunisian high school students was 14.01%. Risk factors were anxiety symptoms ($p=0.034$, $ORA=2.09$), poor relationships within the family ($p=0.001$, $ORA=2.62$), mothers' employment as mid to high level executives ($p=0.002$, $ORA=2.72$), no parental limitations on the amount of time spent on playing video games ($p=0.000$, $ORA=3.44$), an associated problematic internet use ($p=0.000$, $ORA=3.47$) and no playing sports ($p=0.011$, $ORA=3.67$).

Discussion: The observed rate of the affected adolescents point out to a need for effective education and prevention programs. The identification of risk factors can help to alert mental health providers to be careful to screen these patients for problematic video game use.

Keywords: Addiction; Epidemiology; Adolescent psychiatry; Risk factor

Introduction

Playing video games is now a major leisurely pursuit among adolescents in many parts of the world [1-3]. Initially, playing is not pathological but it becomes so for some individuals when the activity becomes dysfunctional. Internet gaming disorder has been included in the emerging measures and models section of the fifth edition of the Diagnostic Statistical Manual [4,5] as a subject of further empirical enquiry. The terms used to describe problematic video game use (PVU) vary across the research literature [5]. Data from various countries around the world suggest that between 0.2% to 15.5% of the adolescents are engaged in PVU [6-10]. A summary of prevalence studies found that there was a higher prevalence of problematic video gaming in East Asian populations, compared to Western European, North American and Australian populations [11].

The study of risk factors for PVU has the potential to help develop interventions to combat this condition. Researchers have been investigating whether there is an association between computer gaming and smoking, drug use, depression [12], social anxieties [13], hyperactivity [14], and sensation seeking [15]. Most of these studies found correlations between problem gaming and negative outcomes.

In Tunisia, like in many parts of the world, playing online or offline games has become a popular activity among adolescents. Tunisia, which is a relatively small and homogeneous country, belongs to the Maghreb region of North Africa and the Arab world. It is known for its religious and ethnic homogeneity as well as its deeply rooted historical commitment to moderate Islam. According to the 2016 statistics, its population was estimated at about 12 million people. Its economy has historically depended on olive oil, phosphates, agri-food products, car parts manufacturing, and tourism. Sfax is a city in Tunisia of about 955,500 inhabitants. The city of Sfax occupies a pivotal place on the national scene and is often described as Tunisia's "second city" after

the capital Tunis. These socioeconomic and culture factors have made high-tech devices (computer, tablet, and smartphone) become a part of everyday life in Sfax. In fact, the rapid increase of Internet cafes and PC bangs in front of the lack or insufficient reinforcement of video game copyright protections and illegal selling of video game CD at cheap prices lead us to think about the prevalence and risk factors of PVU in Sfax, which could be as high as what is registered in East Asian countries. Previous studies have focused on the prevalence and risk factors of problematic Internet use among teenagers in Tunisia [16,17]. However, to the best of our knowledge, no study has so far focused on the prevalence and risk factors of PVU among adolescents in Tunisia.

Materials and Methods

Subjects

This study has extended over a month from January 15 to February 15, 2009 and covered students enrolled from all the public schools in communal areas of the city of Sfax. The subjects were selected by random sampling in two stages. The first stage involved cluster sampling, which selected schools from a list of the all upper secondary schools in the communal areas of Sfax. In the second stage, students were stratified by grade level. The basis of this survey consists of a list of classes provided by the headmasters of the schools that were selected in the first stage of

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Received July 07, 2018; Accepted July 20, 2018; Published July 28, 2018

Citation: Chérif L, Ayadi H, Khmakhem K, Kacem IH, Kammoun S, et al. (2018) Problematic Video Game Use among Teenagers in Sfax, Tunisia. J Health Educ Res Dev 6: 268. doi: 10.4172/2380-5439.1000268

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sampling. The minimum size of the sample was 600 students based upon the prevalence rates of PVU reported in several previous studies, which vary between 0.2% and 15.5% [6-10]. To constitute this sample, seven secondary schools amongst the twenty one public secondary schools in Sfax were drawn. Then, for each selected secondary school, three classes were randomly selected. The sample was eventually composed of 578 students, 263 (45.5%) males and 315 (54.49%) females. The age of these students ranged between 14 and 20 years, with an average age of 16 years (SD=1.26).

Procedure

All the students in the selected classes were informed about the objectives of the study and the procedures to participate. The number of responses was 578 out of 600 which corresponds to a rate of 96.33%. Questionnaires were distributed by the teachers during the classes and were completed anonymously in the classrooms during class time. The student's name or other identifying information was not included, except for the student's grade, age and school. The research was approved by the Ethics Committee of the Medicine University of Sfax.

Instruments

All the screening instruments were translated into Arabic. Screening for PVU was performed using the questionnaire developed by Fischer [18], which was thought to have adequate validity and reliability. This questionnaire was also based on the DSM-IV criteria for gambling addiction [19]. Problematic video game use is detected if the subject meets four of nine criteria.

We also assessed Internet addiction using Young Internet Addiction Test (IAT) [20], one of the most widely used measures of internet addiction. This eight-item questionnaire was adapted from the DSM-IV criteria for pathological gambling [19]. Each question was answered yes or no. Five or more "yes" responses were considered to be a diagnostic of internet addiction. The Arabic version of this questionnaire has been recently validated on an adolescent sample [21]. In order to assess psychiatric symptoms in our study sample, we used the Hospital Anxiety and Depression (HAD) Scale [22], a widely used self-rating scale that scans anxiety and depression symptoms. The cutoff point for the HAD depression and anxiety subscales is ≥ 10 .

In addition to demographic characteristics, survey instruments included several items that were specifically designed to capture the amount of time adolescents spend playing video games. Compulsive tobacco and alcohol consumption were assessed on the basis of two questions: "Do you consider yourself incapable of quitting smoking/drinking?" Data concerning socio-demographic, family related, individual and environmental factors were gathered on a form completed by respondents. Subjects were asked to classify each parent's occupation according to the following four categories: 1) not working, 2) laborer, 3) middle level manager, or 4) senior level manager. Family size was assessed by asking for the number of family members living in the home. A family having more than three children was defined as large. The following questions had yes or no answers: "Do you play sports regularly," "Do you have friends?" and "Are you involved in an artistic activity, such as music, dance, drawing or theater?" Familial relationship quality was assessed with the question "How would you describe your communication with your family members?" Participants could choose one of four responses: nonexistent, poor, average, good.

Statistics

Data entry was performed using the epidemiology and statistics

software of SPSS and Excel. Descriptive statistics were used to identify the frequencies for qualitative variables and averages for quantitative variables. A Chi Square analysis was applied to look for factors related to PVU. Rejection of the null hypothesis was set at $P < 0.05$. A multivariate logistic regression analysis was used to adjust potential confounding factors.

Results

Prevalence of problematic video game use

Table 1 shows the number and percentage of students meeting criteria for PVU.

Risk factors of problematic video game use

Socio-demographic risk factors: Table 2 shows socio-demographic risk factors for PVU. Neither sex nor father's occupation was predictive, but mother's being employed as a middle to upper-level executive was significantly correlated with PVU, as shown in Table 2.

Individual risk factors: Individual characteristics associated with PVU are shown in Table 3. Problematic Internet use, depression and anxiety symptoms emerged as the three strongest individual risk factors for PVU. Engaging in sports activities had a protective effect.

Family risk factors: Table 4 shows family variables. Poor family relationships and familial violence were correlated with PVU.

Risk factors related to access to video games: Table 5 shows risk factors related to access to video games. PVU was significantly associated with spending five or more hours a day on the Internet (as reported by the adolescent). No parental control of the amount of time their adolescents spent on video game use, and poor dialogue about video games between parents and adolescents were significantly correlated with PVU.

Multivariate analysis: Six variables were identified as incremental risk factors for PVU (Table 6). These risk factors consist of anxiety symptoms ($p=0.034$, ORA=2.09), poor relationships within the family ($p=0.001$, ORA=2.62), mothers' employment as mid to high level executives ($p=0.002$, ORA=2.72), no parental limitations on the amount of time spent on playing video games ($p=0.000$, ORA=3.44), an associated problematic internet use ($p=0.000$, ORA=3.47) and no playing sports ($p=0.011$, ORA=3.67).

Discussion

In the present study, the prevalence of PVU among urban high school students in Sfax city is 14.01%. International estimates of PVU widely vary. In fact, in the USA, it is 8.0% in Australia [7,8] in Germany 11.9%, [6] and 15.6% in China [10]. In the present study, the PVU prevalence rate indicates prevalence higher than the one found in other Asian countries [10,23]. It is unclear if the reported wide range of prevalence estimates is related to cultural differences between regions or countries, or because of the different approaches applied in the definition and evaluation of PVU. The absence of a standardized definition covering all ages and genres could cause this variety of prevalence. In addition, measurement instruments differ from one study to another. In fact, the lack of validation of a standard universal instrument based on previous studies is a critical problem. The prevalence of PVU recorded in the present study is among the highest figures in the literature. Several factors may explain this: on the one hand, other researchers distinguish between high engagement and problematic use [24]. In this study, no clear boundaries between the two groups appear. The present

	Males (%)	Females (%)	Total (%)
No PVU*	44.46	55.53	85.98
PVU*	51.85	48.14	14.01
Total	45.5	54.49	100

*Problematic Video game Use

Table 1: Number and percent of students meeting criteria for problematic video game use (PVU).

Factors		PVU* (%)	No PVU* (%)	p
Sex	Male	51.21	43.76	0.54
	Female	48.78	56.23	
Father's occupation	No occupation/Unskilled worker	43.09	54.06	0.11
	Mid- to upper level manager executive	56.91	45.94	
Mother's occupation	No occupation/Unskilled worker	62.19	83.96	0.000
	Mid- to upper level manager executive	37.81	16.04	

*Problematic Video game Use

Table 2: Socio-demographic risk factors for problematic video game use (PVU).

Factors	PVU* (%)	No PVU* (%)	p
Playing sport	9.76	20	0,031
Social activity	41.46	35.04	0,26
Friends	96.34	96.34	0,58
Poor school performance	37.04	36.69	0.95
Smoking	7.31	9.76	0.54
Alcohol use	3.66	7.31	0.56
Problematic Internet use	43.09	13.86	0.000
Anxiety	30.48	18.21	0.009
Depression	15.83	5.49	0,001

*Problematic Video game Use

Table 3: Individual risk factors for problematic video game use (PVU).

Factors	PVU* (%)	No PVU* (%)	p
Large family	80	78.01	0,15
Single-parent family	69.52	90.24	0,16
Family psychiatric history	4.87	13.86	0,32
Familial violence	100	95.2	0,057
Poor family relationships	53.1	41.9	0,059

*Problematic Video game Use

Table 4: Family risk factors for problematic video game use (PVU).

Factors	PVU* (%)	No PVU* (%)	p
Supervision of types of video game used by their adolescents	24.39	27.29	0.12
Supervision of time spent on playing video games	54.87	54.05	0.000
Poor <i>dialogue</i> about video games between <i>parents</i> and <i>adolescents</i>	31.7	35.04	0.03
Video game playing time (mean \pm SD hours per week)	12.95 (\pm 1.77)	7.07 (\pm 1.67)	0.002

*Problematic Video game Use

Table 5: Access and parental supervision in problematic video game use (PVU).

Covariables	Univariate analysis		Multivariate analysis		
	OR*	p	AOR**	95% CI***	p
Mother's occupation mid- to upper level manager executive	3.09	0.000	2.72	1.45-5.1	0.002
Playing sport	2.26	0.03	3.67	1.35-9.9	0.011
Problematic Internet use	4.93	0.000	3.47	1.87-6.43	0.000
Anxiety	1.65	0.06	2.09	1.05-4.13	0.034
Depression	2.69	0.005			
Familial violence	1.17	0.05			
Poor family relationships	1.57	0.05	2.62	1.46-4.69	0.001
Poor <i>dialogue</i> about video games between <i>parents</i> and <i>adolescents</i>	2.06	0.01			
No supervision of time spent on playing video games	3.15	0.000	3.44	1.84-6.43	0.000

*Odd Ratio; **Adjusted Odds Ratio; ***95% Confidence Interval

Table 6: Univariate and multivariate analysis.

study would also have been improved by collecting information from additional sources, like parents and teachers. A clinical examination would be necessary to support the diagnosis of PVU. On the one hand, the present study is not representative of the school population as it was carried out exclusively in urban areas where access to video games is easier than in the rural ones. On the other hand, great contrasts exist between the affluent, urban and educated segments of the population, and the rural, illiterate, and disadvantaged. Besides, access to health, education, potable water, electricity and employment is a real problem in the rural areas of Tunisia. In fact, video games in these regions are luxury.

To the best of our knowledge, this is the first published report on the risk factors of PVU among adolescents in Tunisia.

In the present study, the results are not in line with what was found in previous research studies which stated that males play video games PVU more than females do [5,25]. Moreover, there is a strong relationship between PVU and the number of hours invested in video games as mentioned in other studies [26]. The occupation of the mother as middle to upper-level executive was significantly associated as a risk factor for PVU. Tunisian women have been known for their high level of education compared to their counterparts in the Arab world. The global number of Tunisian graduate women reflects this. This finding may be explained by the fact that the increasing access to video games from home is among the higher income Tunisian families. In addition, it has been suggested that some parents support their teenagers' choices to spend a great amount of their leisure time in front of the screen because they think that it is better to keep their children at home than let them go out, which may expose them to danger. In the present study, a self-reported lack of playing sports is associated with PVU. This result is controversial in the literature [26-28]. In the present study, it was found that 43.09% of the adolescents meeting Fisher's criteria for PVU also meet Young's criteria for Internet addiction which joins the results of Van Rooij [13]. Moreover, anxiety and depression symptoms in our sample were significantly more prevalent among adolescents who were identified in the group with PVU than in the non PVU group. Domingues et al. [29] found that screen time has been negatively associated with depression and anxiety. It is possible that for anxious individuals, PVU will have an anxiolytic function like other kinds of addictive behaviors. It may also aggravate pre-existing anxiety disorders. It is unclear if anxiety increases the risk for an adolescent to become a pathological gamer, or a pathological gaming increases the risk of anxiety disorders [30]. Moreover, in this study, the lack of supervision by parents of the time spent playing video games is considered as the second most important risk factor. This finding also joins the results of Muñoz et al. [26] and supports the opinion of social criticism which pointed to a trend towards an increasing isolation of the family members and unresolved and unspoken family conflicts as risk factors for PVU.

Conclusion

Our data are limited by the fact that we did not obtain corroborating data from other sources mainly from parents. Confirmation of the PVU diagnosis by means of a psychiatric interview is essential. Another limitation for this study is that it is not representative of the entire city of Sfax since it was conducted only in its urban area. Given the cross-sectional nature of the study, causality cannot be inferred. This leads to the question as to whether PVU is a unique phenomenon or whether it reflects the co-occurring symptoms of underlying mental health impairments. Despite these limitations, we contend that our study

makes several important contributions to the video gaming literature. In fact, no studies of PVU have been conducted at the national level. Therefore, the present study is the first to provide data to answer questions about the prevalence and risk factors of PVU among the youth in Tunisia. In conclusion, and given the vulnerability of adolescents who are facing developmental challenges, a good understanding of video gaming activities among this group would be helpful for tailoring effective education or prevention programs to promote their health. The observed rate of the affected adolescents reflects the need for effective education and prevention programs or strategies in Sfax to avoid negative effects of video gaming on adolescents. In this study of urban Tunisian adolescents, we found several socio-demographic, family related, individual and environmental factors to be associated with PVU. It seems unlikely that PVU could be predicted by one factor; therefore, it is probably necessary to have the co-occurrence of several factors. In fact, it is important to inform parents that moderate video game use may be a positive experience whereas an excessive use may cause problems. However, several important questions, including information on how children can be helped, and what type of help might be most effective, remain unanswered.

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